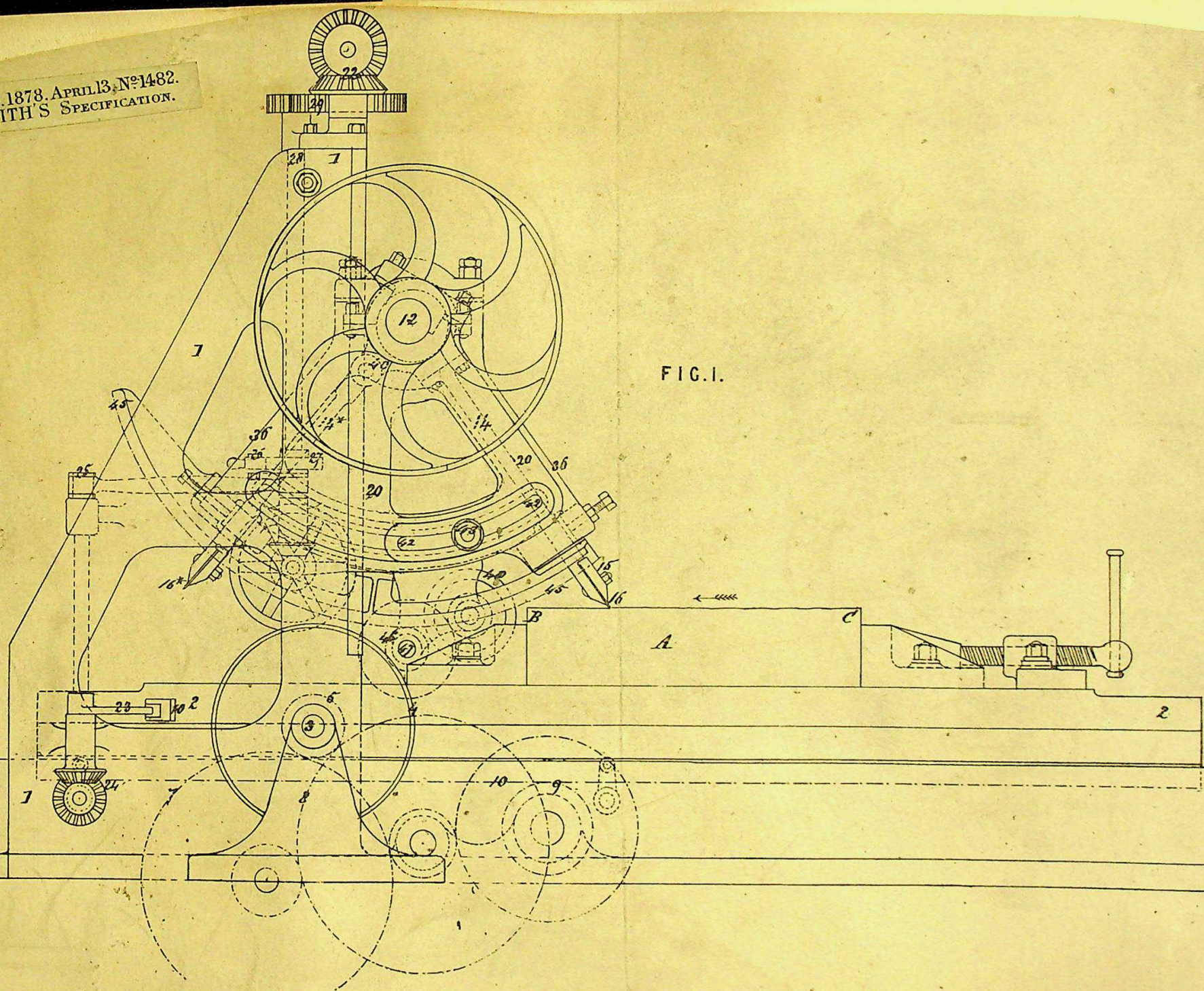


A.D. 1878. APRIL 13, N° 1482.  
SMITH'S SPECIFICATION.

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FIG. 1.



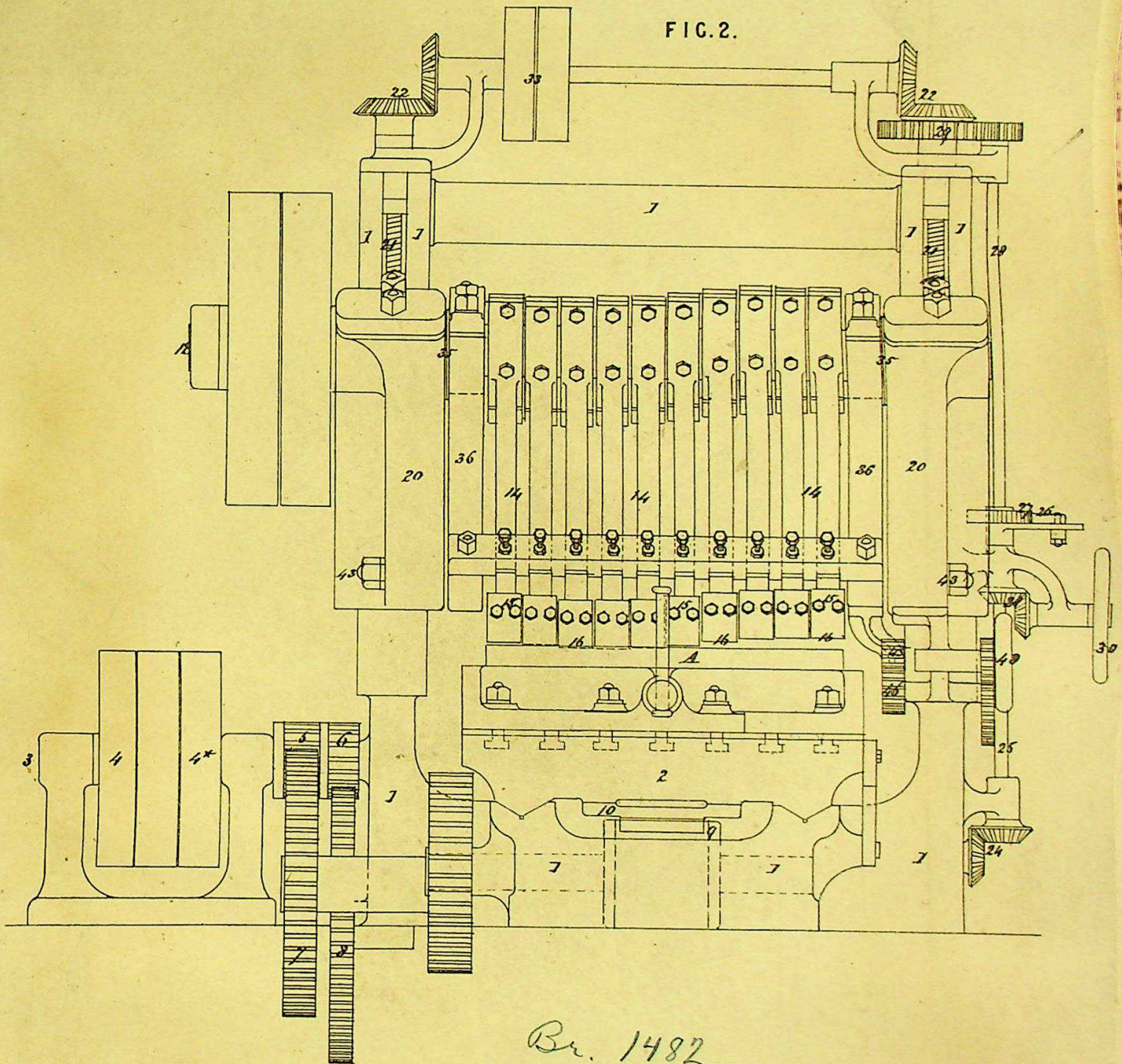
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FIG. 2.



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SMITH'S SPECIFICATION

FIG. 3.

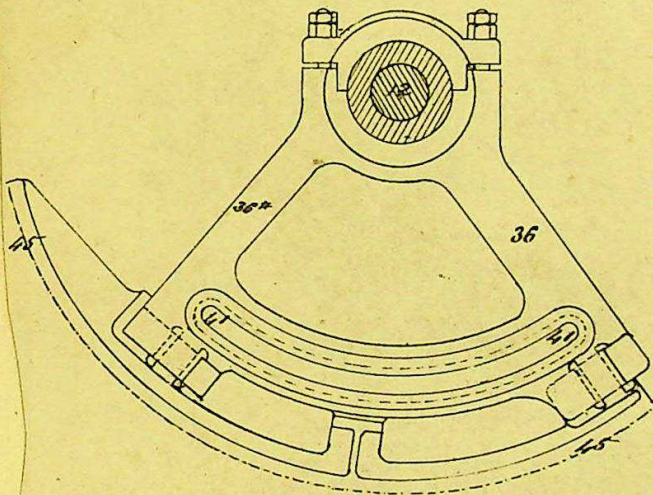


FIG. 5.

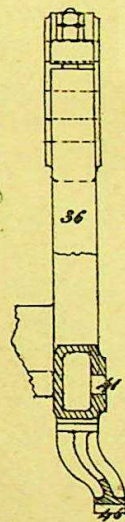
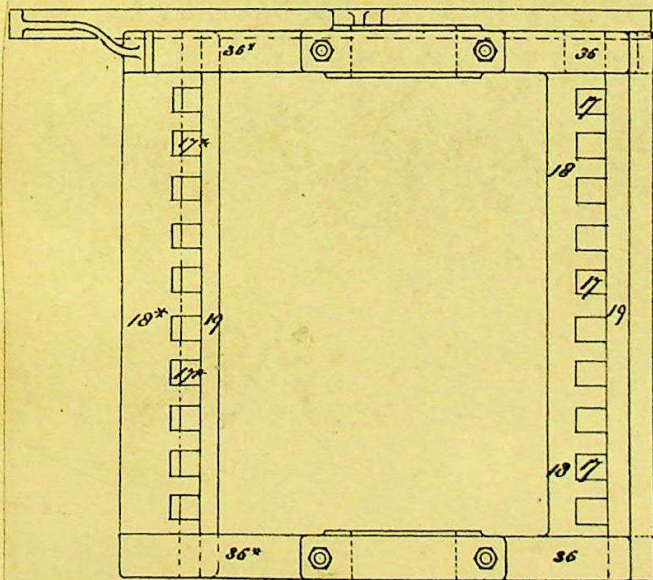


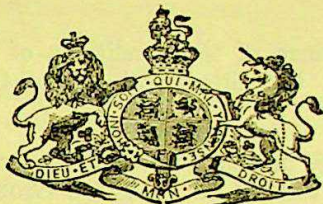
FIG. 4.



Malby & Sons, Photo-Litho.

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A.D. 1878, 13th APRIL. N° 1482.  
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**Machinery for Facing or Dressing Stone.**

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LETTERS PATENT to John Smith, of Rochdale, in the County of Lancaster, Engineer, for the Invention of "IMPROVEMENTS IN MACHINERY FOR FACING OR DRESSING STONE."

Sealed the 11th October 1878, and dated the 13th April 1878.

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PROVISIONAL SPECIFICATION left by the said John Smith at the Office of the Commissioners of Patents on the 13th April 1878.

JOHN SMITH, of Rochdale, in the County of Lancaster, Engineer. "IMPROVEMENTS IN MACHINERY FOR FACING OR DRESSING STONE."

- 5 My Invention relates to improvements upon that machine for which Letters Patent were granted to Benjamin Josiah Brearley and George Henry Marsden, dated 2nd December, 1875, No. 4173, or to other machines of similar arrangement, and has for its objects the alteration of the angle at which the cutters work, the substitution of one description of cutter for another, and operating upon the stone  
10 as it travels, not in one direction only, but in both. For these purposes I mount the lower supporting parts of the cutters upon a segment, which, being turned, alters the angle at which the cutters act.

- For the second object, the segment supports, at its other end, a different description of cutter, and either of them may therefore be turned into the acting position  
15 at pleasure, and in like manner more than two descriptions of cutters may be employed.

For the third object the angle of the cutter may be reversed when the stone has been operated upon while moving in one direction, and the cutting operation then takes place while it is moving in the other direction.

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*Smith's Improvements in Machinery for Facing or Dressing Stone.*

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said John Smith in the Great Seal Patent Office on the 12th October 1878.

JOHN SMITH, of Rochdale, in the County of Lancaster, Engineer. "IMPROVEMENTS IN MACHINERY FOR FACING OR DRESSING STONE." 5

My Invention relates to improvements upon that machine for which Letters Patent were granted to Benjamin Josiah Brearley and George Henry Marsden, dated 2nd Decr. 1875, No. 4173, or to other machines of similar arrangement, and has for its objects the alteration of the angle at which the cutters work, the substitution of one description of cutter for another, and operating on the 10 stone as it travels, not in one direction only, but in both.

In the accompanying Drawings, Fig. 1 represents the machine in side elevation; Fig. 2 is an end view thereof; and Figs. 3, 4, and 5, detached views, to be hereafter particularly referred to.

At 1 is the stationary framework of the machine, upon which is mounted the 15 sliding bed 2, after the manner of an ordinary planing machine; at 3 is a main shaft driven through a system of fast-and-loose pullies 4, 4\*, and on which shaft are pinions 5, 6, actuating wheels 7, 8, which by means of the gearing, shewn in the Drawing, and indicated by dotted lines in Fig. 1, actuate alternately a pinion 9 in gear with a rack 10 on the bottom of the sliding table 2, the said pinion 9 being 20 alternately driven by means of the two fast pullies 4, 4\*, so as to reverse the motion of the table 2 for forward and backward movements, and thus carry the stone A to be operated upon towards and from the cutters, this arrangement being well known in planing and other machines, suitable stops being adapted to the sliding part to shift the strap guide, which in the Drawing is shewn at 10; but I 25 would here remark that this reversing motion is shewn in the Drawing so arranged as to make the return motion quicker than the advance, as is also well known.

According however to one object of my Invention these motions may be effected at the same speed, as will hereafter be pointed out. At 12 is the shaft upon which the several excentrics are formed for actuating the rods 14, which carry by means 30 of clamps 15 the cutter 16, such rods 14 moving in slots 17 formed in a cross bar 18, carried as hereafter to be described, by a frame 20, and being confined therein, but so as to slide freely by a cap bar 19. The frame 20 is mounted upon V guides formed on the stationary frame 1, and is capable of being moved upward or downward by screws 21, connected together by bevil wheels 22, which, as the several 35 cuttings take place, are turned by a stop on the bed 2, arriving in contact with a lever 23, the axis of which gives motion to bevil wheels 24 on an upright shaft 25, which by means of a lever carries a click 26, driving a ratchet wheel 27 on the shaft 28, and this shaft through the medium of spur wheels 29 gives motion to the aforesaid bevil wheels 22, by which means the cutters are lowered after each 40 operation upon the traversed stone.

For moving upward the cutters bodily there is a hand pulley 30, which by means of bevil wheels 31 may turn the shaft 28, or the same movement may be accomplished by the fast-and-loose pullies 33, the former of which may be driven by the motive power. 45

The above-described arrangements refer simply to a method of carrying out the movements specified under the Patent of Benjamin Joseph Brearley and George Henry Marsden aforesaid, and being ordinary arrangements, as applied to similar purposes, do not constitute any part of my present Invention; but I now proceed to point out my improvements thereon. 50



*Smith's Improvements in Machinery for Facing or Dressing Stone.*

Upon the sliding frame 20 are formed circular projecting parts 35, and on these are mounted arms 36, 36\*, united by cross bars 18, 18\*, thus forming a swinging frame, as shewn in the detached views, Figs. 3, 4, and 5, each of the said cross bars being provided with slots 17, 17\*, in which the rods 14, 14\*, of the cutters 16, 16\*, are mounted, so that in addition to the ordinary cutters 16 there is another set 16\*, one set only however acting at the same time, as will hereafter appear.

For the purpose of actuating the second set of cutters 16\* the clips of the excentrics are provided with lugs, as at 40, to which the arms 14\* are connected. The bottom of the swinging frame 36, 36\*, is provided with a slot 41, through which and through another slot 42 in the vertically sliding frame 20 a bolt 43 passes, and this bolt loosened, the swinging frame 36, 36\*, may be turned upon its projecting centres 35 so as to bring the tools 16\* into the position of those shewn at 16, or at any intermediate angle, at which positions they may be fixed by tightening the bolt 43, but at all times the said swinging frame and the sliding frame 20 move bodily together when the latter is raised or lowered. By this arrangement it will be seen that although the swinging frame 36, 36\*, which carries the cutters is concentric with the shaft 12 it does not bear thereon, but upon the circular projecting parts 35. One arm of the swinging frame 36, 36\*, is formed with a toothed quadrant 45, in gear with which is a pinion 46, the axis 47 of which is connected by gearing to a pulley handle 48, and by turning this therefore the said swinging frame may be turned so as to alter the positions of the two sets of cutters on one of them, as above referred to,

I will now assume that the table is moving in the direction of the arrow and that the cutters 16 are operating in the known manner to dress the stone, and that having been done that the table is run back preparatory to another clipping process; then (if it is desired) the pulley handle 48 may be turned so as to move the quadrant 45 and alter the angle of the cutter, as above explained, so that the next cut (when the frame 20 has been lowered) may be effected under altered conditions, and so on, for succeeding cuts at pleasure. Or, instead of this, suppose it desired that after a cutting or cuttings have been effected it is desired to use a tool of a different character, the first for instance, for roughing out, and the other for finishing, then a set of tools different to those shewn at 16 may occupy the position of those shewn at 16\*, and before the next cut takes place the toothed segment 45 may be turned so as to cause the said cutters 16\* to occupy the position of those shewn at 16, ready to perform the operation of cutting, but modified by the character of the tool.

The above description refers to the operation of cutting when the stone is travelling in one direction only, but suppose it desired that the said operation shall take place when the stone is being traversed both forward and backward, then, after the former of these movements has taken place, the swinging frame is turned, as above described, so as to bring the series of cutters 16\* into the position of those shewn at 16, and having been there fixed by the bolt 43 the angles will be reversed, and the stone being caused to travel backward the cutting or dressing will commence at the end C instead of at B, but in this case the return motion of the table 2 will be at the same speed as the aforesaid motion, to effect which it will only require a modification of the gearing, as will be well understood.

It will have been seen that both sets of cutters are constantly vibrating although one only at a time is cutting, and in order to provide for the angle at which the second set 16\* is worked by the excentrics the rods 14\* are jointed to the excentric clamps, as at 40, and I would remark that instead of two sets of tools three or more may be mounted in the swinging frame, to be brought into working position as desired, and that the tools are shaped for plain surfacing, moulding, or any other required description of work.

Having thus described and ascertained the nature of my said Invention, and the manner in which the same is to be performed, I desire it to be understood that I claim as secured to me under the above in part recited Letters Patent, and for the



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*Smith's Improvements in Machinery for Facing or Dressing Stone.*

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purposes above set forth, the use of the swinging frame for carrying the tools, substantially as described.

In witness whereof, I, the said John Smith, have hereunto set my hand and seal, this Eleventh day of October, in the year of our Lord One thousand eight hundred and seventy-eight.

JOHN SMITH. (L.S.)

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LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
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For Her Majesty's Stationery Office.

1878.